Depression Intensity Estimation via Social Media: A Deep Learning Approach

Vishal Nimbolkar[1], Dipak Patil[2], Prathmesh Sangai[3], Ishwar Vyas[4], Mr. Nilesh Sable[5]

Students, Department of Information Technology[1,2,3,4]

Lecturer, Department of Information Technology[5]

BRACT's Vishwakarma Institute of Information Technology, Pune, Maharashtra, India

Abstract: *Stress and depression are two of the most common and incapacitating mental illnesses that have a significant impact on society. Automatic health monitoring systems might be needed to improve the diagnosis of stress and depression via social networking. Sentiment analysis is the practice of finding feelings or views by using content mining and natural language processing tools. full of feeling Computing is the study and creation of apparatus and devices that can identify, comprehend, process, and mimic the effects of people. Effective algorithms and frameworks for a target evaluation and surveillance of mental disorders, particularly depression and stress, could be provided by deep learning and sentiment analysis approaches. The application of sentiment analysis and deep learning methods for stress identification and monitoring is covered in this study. This study examines how to identify and keep track of stress and depression using deep learning and sentiment analysis techniques. Furthermore, a fundamental framework for a multimodal framework that incorporates estimation investigation and in-depth techniques for feeling processing is provided. Using this approach, stress and sadness will be evaluated. The paper outlines the core issues and contrasts them with the framework's design.*

Keywords: Deep learning

I. INTRODUCTION

Social media is most likely the largest source of human-generated text input. The thoughts, remarks, and criticisms of internet users on many topics reflect their attitudes and emotions. This research offers a knowledge-based system that keeps track of users' emotional well-being in order to spot those who might be going through psychological issues, such as stress and sadness. The symptoms of various psychological diseases are typically passively noted. According to the author, in this situation, extracting online social conduct offers a possibility to actively identify psychological disorder at an early stage. It may be difficult to diagnose the disorder since the psychological factors covered in the conventional diagnostic criteria questionnaire cannot be seen by the registers of online social activities. Depression and stress are two of the most common and incapacitating mental disorders, and they have a big societal impact as well. Currently, methods for diagnosing stress and depression rely on self-reporting as well as the expert assessment of medical experts. Effective health monitoring systems and diagnostic tools may be necessary to improve the performance of healthcare workers and lower healthcare costs. Sentiment and deep learning technologies may be able to help with these objectives by providing effective instruments and frameworks for unbiased assessment. Instead of seeking to replace psychologists and psychiatrists, these programmes and technologies should support their decisions. Our novel and state-of-the-art strategy does not rely on respondents' self-reports of those psychological features on surveys to identify psychological diseases. Instead, provide a machine learning method that precisely identifies possible problems by utilising the attributes gleaned from social network data for the diagnosis of psychological disorders in social networks. We assess 2 characteristics in addition to the features of the two types of psychiatric disorders, and we use machine learning to process enormous amounts of data.

1.1 Motivation

The difficulty of detecting early-stage depression from user tweeting behavior was discussed in this study. We suggested a deep learning method for assessing the severity of depression using information from social media. The necessity to use social media to assess the severity of depression in real time so that the right therapy may be offered

depending on the severity of the depression served as the driving force behind this study. We established a comprehensive set of discriminative depression-related user characteristics, developed a self-supervised relabeling strategy for a benchmark depression dataset, and proposed an LSTM network to categorize different levels of depressed Twitter users. Numerous trials using a common dataset showed that our method was more effective than the other methods for intensity estimation.

II. LITERATURE SURVEY

A. Hao, G. Pang et al, proposed based providing appropriate social support to prevention of depression for highly anxious sufferers. In this study, AI and DI follow the Gaussian distribution, according to the researchers. As a result, when clustering AD points, a GMM has been used. As a result, a number of useful clusters have been discovered, each with its own semantics and observations. Correlation analysis was used to evaluate the relationship between anxiety, depression, and SS. Based on the examination of real data sets, our findings imply that high-level SS can minimize the risk of depression in extremely stressed undergraduates.

B. Pappa, V. Ntellaet al, proposed based "Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis. In this paper, our systematic review and meta-analysis provide a timely and complete synthesis of the available information, showing healthcare professionals' high rates of depression, anxiety, and insomnia. The findings can be used to quantify staff support needs and to inform tiered and personalized treatments that improve resilience and reduce susceptibility in pandemic situations.

C. Anwaret al, proposed based Inferring location types with geo-social-temporal pattern mining. In this Study, Our systematic review and meta-analysis provide a timely and complete synthesis of the available information, showing healthcare professionals' high rates of depression, anxiety, and insomnia. The findings can be used to quantify staff support needs and to inform tiered and personalized treatments that improve resilience and reduce susceptibility in pandemic situations.

D. Shen et al, proposed based "Depression detection via harvesting social media: A multimodal dictionary learning solution. The goal of this study is to use social media to diagnose depression in real time. This study uses a multimodal depressive dictionary learning method to detect depressed people in Twitter, using benchmark depression and non-depression datasets as well as well-defined discriminative depression-oriented feature groups. On a large-scale depression-candidate dataset, the researchers looked at the contribution of feature modalities and identified depressed users to uncover some underlying online behaviour differences between depressed and non-depressed users on social media.

E. Shenet al, proposed based on Cross-domain depression detection via harvesting social media.The addressed the issue of using multi-source datasets to improve depression identification using social media in this work. A cross-domain Deep Neural Network model with Feature Adaptive Transformation & Combination approach (DNN-FATC) to transmit meaningful information across diverse domains is presented in Proceedings of the Twenty-Seventh International Joint Conference on Artificial Intelligence.

III. EXISTING SYSTEM

In past studies, they provided a reliable warning about the possibility that the COVID-19 pandemic may harm the mental health of HCWs. Further research is needed to determine the long-term impact of the COVID-19 pandemic on HCW mental health because all of the studies included in our meta-analysis were cross-sectional. Any challenge that requires a system to swiftly examine a series of elements associated to an object and anticipate the object's class can be solved using the general measure of latency. They only examine Flatency in relation to the early detection of depression on social media. Wilcoxon's Signed Rank significance test (vanilla BS) was used to compare each model to the baseline. These demonstrated how they may be coupled while comparing the effectiveness of three affective strategies: affective word embeddings as input, affective loss functions, and effectively diversified decoding.MDL, which

encompasses both online social media usage and clinical depression criteria. Determining if a user is depressed or not is how their multimodal depressive dictionary learning algorithm handles the issue.MDL is paired with our tagging method for measuring depression intensity.

IV. CONCLUSION

The objective of this study is to use social media to quickly detect depression. Throughout the ongoing COVID-19 pandemic and numerous lockdowns, mental health has been a top concern. We proposed a deep learning approach for evaluating the severity of depression using social media data. In order to help with the right therapy based on the degree of the depression, this project aims to estimate the severity of depression in real time utilising social media. We developed a self-supervised relabeling method for a benchmark depression dataset, created a comprehensive set of discriminative depression-related user factors, and proposed an LSTM network to identify different levels of depressed Twitter users. The effectiveness of our method, which outperformed the other options for intensity estimate, was demonstrated by extensive studies on a common dataset. More than 2% of the time, our method of binary categorization performs better than the one currently in use. This study indicates several promising future directions. It would be interesting to look into the user locations and social network structure to identify the spread of depression among social communities. In a subsequent study, the researcher will take the lead in developing automatic preliminary assessment techniques based on social data.

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